APPENDIX B: RADIO FREQUENCY ALLOCATION STATUS

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NESDIS POSITION

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(SUBJECT TO LIMITATIONS FOUND IN COMMENTS and NOTES)

NESDIS will update this table and its position on RF availability in mid-late June 2003

Option #	Sensor DOWNLINK to Wallops (prime), Fairbank (back-up), GSFC (back-up)	NESDIS Comments
#1	8215-8400 MHz X-band	Stage 1 petition filed by NESDIS with NTIA. Use of this spectrum requires a small satellite separation between DOD DSCS at 135°W and GOES, as such, NOAA investigating relocating to 137°W. This sharing situation is between the GOES satellite transmitter and the DSCS satellite receiver. Per NTIA, NOAA coordination with DOD critical. Also per NTIA NOAA coordination with Fixed Sat. Ser. and Earth Exploration Satellite Service (EESS), NASA EESS, DOC EESS, non-gov't EESS space systems and gov't. Government and non-Government non-geostationary EESS networks operate in the band 8025-8400 MHz. An analysis will be needed to determine the sharing compatibility between GSO EESS and NGSO EESS networks. NASA concerned about adjacent RFI from 8025-8400 MHz users into its Goldstone receiving earth station operating in the space research service (deep space)in the band 8400-8450 MHz ; this suggests a guard band is needed. Further, ITU-R Recommendation SA.1157 states maximum interference power levels to earth-station receivers: PFD (-255.1 dB($W/m^2 \cdot Hz$)) and PSD (-220.9 dB(W/Hz)) 8400MHz. This limit would have to be met at the Goldstone earth station. In order to protect the terrestrial services, the power flux-density limits of TABLE **21-4** of the Radio Regulations needs to be met, i.e. between –150 and –140 dB(W/m^2) per 4 kHz bandwidth

#2	8025-8175 MHz X-band	Stage 1 petition filed with NTIA. Use of this spectrum requires a small satellite separation between DOD DSCS at 135°W and GOES, as such NOAA investigating relocating to 137°W. This sharing situation is between the GOES satellite transmitter and the DSCS satellite receiver. Per NTIA, NOAA coordination with DOD critical. Also per NTIA, NOAA coordination required with FSS and EESS, NASA EESS, DOC EESS, non gov't EESS space systems and gov't. Government and non-Government non-geostationary EESS networks operate in the band 8025-8400 MHz. An analysis will be needed to determine the sharing compatibility between GSO EESS and NGSO EESS networks. NASA concerned about RFI from 8025-8400 MHz users into deep space research network, Goldstone earth station, at 8400-8450 MHz. Further, ITU recommended PFD and PSD interference limits must be met above 8400MHz,see #1 above. In order to protect the terrestrial services, the power flux-density limits of TABLE **21-4** of the Radio Regulations needs to be met, see #1 above.
#3	18.1-18.3 GHz Ku-band	Stage 1 petition filed with NTIA. NESDIS pursuing X band with higher priority. On advice of NTIA, to be considered if NESDIS is unsuccessful in obtaining access to 8 GHz spectra. Per NTIA, technology and rain fade issues have to be considered. NTIA has indicated recommended coordination with non-government terrestrial systems in band within a to-be-determined distance of the GOES receiving earth station(s). In order to protect the terrestrial services, the power flux-density limits of TABLE **21-4** of the Radio Regulations needs to be met, i.e. between –115 and –105 dB(W/m^2) per 1 MHz bandwidth.
#4	25.25-27.0 MHz Ka-band	On advice of NTIA, to be considered if NESDIS is unsuccessful in obtaining access to 8 GHz spectra. Per NTIA, technology and rain fade issues have to be considered. NTIA has indicated recommended coordination. Within US, government would be primary spectrum user. New band allocated to EESS. In order to protect the terrestrial services, the power flux-density limits of TABLE **21-4** of the Radio Regulations needs to be met, i.e. between –115 and –105 dB(W/m^2) per 1 MHz bandwidth.

	Processed Data UPLINK to GOES from CDA station(s)	Comments

#1	7190-7235 MHz X-band	NESDIS has not yet submitted a Stage 1 petition to NTIA. Expects to do so by the end of June 2003. Will ask for 15MHz BW, only. Concern with deep space network, informal discussions have been initiated between NOAA and NASA, additional coordination necessary. No issue with DOD and thus no issue with DSCS and GOES satellite separation at 135°W. NESDIS preferred option. The band is not currently allocated to the EESS and may require either a waiver or a modification to the national allocation table.
#2	8175-8215 MHz X-band	Stage 1 petition filed with NTIA. This requires maximum separation between GOES at 135°W and DSCS at 135°W. Amount of separation under study by Aerospace Corp., but greater than that required for either 8025-8175 or 8215-8400 MHz downlink. Per NTIA, NOAA coordination with DOD critical. NASA concerned about adjacent RFI from 8025-8400 MHz users into its deep space research network at Goldstone in the band 8400-8450 MHz.
#3	2025-2035 MHz S-band	Current GOES S-band uplink allocation protected for 3 CDA stations. No additional allocation possible.

	Global Processed DOWNLINK data stream from GOES "Globally"	Comments
#1	1683-1698 MHz L-band	1683-1695 MHz for high resolution GRB data is available. 1695-1698 MHz for other broadcast downlinks. CDA T&C downlink can be located in 1670-1675 MHz band. GOES expansion from the present 1695 MHz up to1698 MHz is an internal NOAA issue. Drafting MOU between NPOES and GOES for the new additional 3 MHz to 1698 MHz. ITU maximum PFD requirements for the radio astronomy band below 1670 MHz are quite strict and must be met. In order to protect the terrestrial services, the power flux-density limits of TABLE **21-4** of the Radio Regulations need to be considered; due to the lack of terrestrial services operating in the US, these limits may be able to be waived. There is also a power flux density limit to protect Metaids (radiosondes), but this may be waived as well since it has been shown that Metaids and Metsats cannot share spectrum.

Notes:

#1. Guard bands required relative to IPO (NPOESS) use above 1698 MHz, and NESDIS (GOES) use below 1698 MHz to avoid RFI.

2. NOAA envisions a spec requiring the use of SRRC filters to allow NOAA to get the BW authorization necessary. NOAA requires out-of-band filtering.

#3. NOAA envisions a spec for directional antenna focused on the CDA stations, which NOAA believes is necessary to get its authorization. Wallops is the prime NESDIS CDA station. NASA GSFC is the GOES 75ºW backup CDA station. Fairbanks is the 135°/137°W backup CDA station.

#4. NTIA oversees use of RF spectrum by all federal agencies.

#5. Earth Exploration Satellite-Service (EESS) - a radio communication payload services between earth stations and one or more space stations. Per ITU, Metsats are a subset of EESS used for meteorological purposes.

#6. ITU PFD limits for EESS and Metsat services must be met.

#7. NESDIS is working to obtain operational X-band approval. If this fails it will attempt to obtain Ku (18.1-18.3 GHz) and/or Ka (25.5-27 GHz) operational approval.